

Work Order ID 109960

December-09-13 2:23:39 PM

FOR TESTING
109960

Page 1

Item ID: D412-596-203

Accept

N900040100

Setup Start *NS1*

Revision ID:

Stop *NS2*

Item Name: 39" Aft Crosstube

Start Date: 12/09/13 Start Qty: 1.00 *1*

Cust Item ID:

Required Date: 12/10/13 Req'd Qty: 1.00 *1*

Customer:

Reference:

Approvals: Process Plan: [Signature] Date: _____ Tooling: _____ Date: _____

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Run Start *NR1*

Stop *NR2*

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
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Draw Nbr	Revision Nbr
D412-596-203	B

100

0.00

100

DOCUMENT CONTROL

DC

Memo

0.00

Document Control

Photocopy bluefile & type labels per PPPD412-596-203 CHG001

110

0.00

110

BENDING MACHINE - CROSSTUBES

CNC Bend 2

Memo

0.00

CNC Alpha 160 Bender

Bend tube as per Dwg D412-596-203 using CNC bender program _____ and Folio FT _____

****USE (4) DT9824 SHIM BLOC TO CHECK STRAIGHTNESS****

JW 14-05-28

127

QC15- Crosstube Dimensional Check

0.00

127

QC

Memo

0.00

Quality Control

MARK CUT LINES

cut @ Height @ 35.72"

5/14/128



Work Order ID 109960

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Start Date: 12/09/13 Start Qty: 1.00 *1*

Cust Item ID:

Required Date: 12/10/13 Req'd Qty: 1.00 *1*

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Reference:

Run Start *NR1*

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Stop *NR2*

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
--------------------------------	--------------------------	----------------------	---------	--------	--------------	---------------	---------------	------------------	----------------

128

0.00

128

Crosstubes

Memo

0.00

CUT TUBE AT HEIGHT ON FAI SHEET

VERF HEIGHT 35.75 BY QC 15 LEVEL INSPECTOR

VERF TWIST 0.922 BY QC15 LEVEL INSPECTOR

JW 14-05-29

FOR
TEST
ONLY

OK

9/14/5/19

14/05/29

130

0.00

130

Crosstubes

Crosstubes

Memo

0.00

1- Drill Tube as per Dwg D412-596-203 Using DT _____ Drill Jigs.

Set-up drill table as per QSI 010

2-Deburr

3- Engrave Part # and Batch # as per Dwg D412-596-203

4-Remove all marks from tube within limits of D412-596-203 DWG.

14.06.03

134 JW

14-05-29

131 install

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December-09-13 2:23:39 PM

Item ID: D412-596-203

Accept

N900040100

Setup Start *NS1*

Revision ID:

Stop *NS2*

Item Name: 39" Aft Crosstube

Start Date: 12/09/13 Start Qty: 1.00

1

Cust Item ID:

Required Date: 12/10/13 Req'd Qty: 1.00

1

Customer:

Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Run Start *NR1*

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop *NR2*

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
--------------------------------	--------------------------	----------------------	---------	--------	--------------	---------------	---------------	------------------	----------------

140

QC6- Inspect dimensions to drawing

0.00

140

QC

Memo

0.00

Quality Control

172

0.00

172

Crosstubes

Memo

0.00

Crosstubes

LOAD TEST TO 3000LB FOR 1 MINUTE

174

Outsource process - NDT per QSI038 4.1

0.00

174

Outsource2

Memo

0.00

Outsource process - NDT

ISSUE P/O TO ACCUREN: 24454

CL 14106/040

Work Order ID 109960

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December-09-13 2:23:39 PM

Item ID: D412-596-203

Accept

N900040100

Setup Start *NS1*

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Stop *NS2*

Item Name: 39" Aft Crosstube

Start Date: 12/09/13 Start Qty: 1.00 *1*

Cust Item ID:

Required Date: 12/10/13 Req'd Qty: 1.00 *1*

Customer:

Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Run Start *NR1*

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop *NR2*

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
176	Receive & Inspect for Damage & Mat'l Certs	0.00							
176									
Packaging	Memo	0.00							
Packaging									
178	QC5- Inspect part completeness to step on W/O	0.00							
178									
QC	Memo	0.00							
Quality Control									

DAS
27
9/89

14/6/16

[Signature]

Work Order ID 109960

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December-09-13 2:23:39 PM

Item ID: D412-596-203

Accept

N900040100

Setup Start *NS1*

Revision ID:

Stop *NS2*

Item Name: 39" Aft Crosstube

Start Date: 12/09/13 Start Qty: 1.00

1

Cust Item ID:

Required Date: 12/10/13 Req'd Qty: 1.00

1

Customer:

Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Run Start *NR1*

Stop *NR2*

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
180	SprayPaint	0.00							
180	SprayPaint	0.00				1	0	0	AR
Spray Painting	Memo								14-6-5
	1-Prime inside & outside crosstube as per QSI 005 4.2								
	BATCH: <u>128826</u>								
	2- MASK UNDERSIDE OF CROSSTUBE AS SHOWN ON DWG BEFORE PAINTING								
	3 -Paint Outside of Tube as per Dart QSI 005 4.2								
	BATCH: <u>129174</u>								
	4- After painting remove masking and apply matte clear coat per QSI005 4.2								
190	QC14- Inspect Spray Paint	0.00							
190	QC	0.00							
Quality Control	Memo								

See attached drawing 12st pg

Shown

Work Order ID 109960***109960***

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December-09-13 2:23:39 PM

Item ID: D412-596-203

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N900040100

Setup Start

NS1

Revision ID:

Stop

NS2

Item Name: 39" Aft Crosstube

Start Date: 12/09/13 Start Qty: 1.00

1

Cust Item ID:

Required Date: 12/10/13 Req'd Qty: 1.00

1

Customer:

Reference:

Run Start

NR1

Stop

NR2

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
--------------------------------	--------------------------	----------------------	---------	--------	--------------	---------------	---------------	------------------	----------------

200

0.00

200

Crosstubes

Crosstubes

Crosstubes

Memo

0.00

1- Install center support using scoth-weld DP460 per QSI 015, as per DWG. note 12.

A/R scoth-weld DP460 BATCH #: 128480

exp: 3/15

2- Install clamp with rubber cushion as per DWG. note 13

3- Abrade mating surfaces of support and crosstube with 400 grit sandpaper, clean the area with 4105S wash 'n' wipe

4- ****IF NOT ALREADY PRESENT ON CHAFFING SHEILD.**** Apply a thin coat of proseal 890 per QSI 015 on inside concave surface of chafing shield and let cure per manufacturer's instructions. Install prosealed chafing shield onto crosstube by applying a thin coat of proseal 890 onto crosstube. Be sure to eliminate any air gaps.

A/R Proseal 890 Batch: _____

5- Install supports clamps using DT as per Dwg D412-596-203, Torque clamps on support to 80-100 IN-LBS. Torque clamps on chafing shield to 40-50 IN-LBS.START CURE TIME: 14-6-5 FINISH CURETIME: 14-6-6

PRIOR TO PACKAGING RE-CHECK TORQUE ON CLAMPS AFTER CURED FOR 24H.

<u>1</u>	<u>0</u>	<u>0</u>	<u>AS</u>
<u>14-6-5</u>			

No chafing shield CPM/6/5

Work Order ID 109960

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Item ID: D412-596-203

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NS1

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Stop

NS2

Item Name: 39" Aft Crosstube

Start Date: 12/09/13 Start Qty: 1.00

1

Cust Item ID:

Required Date: 12/10/13 Req'd Qty: 1.00

1

Customer:

Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Run Start

NR1

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop

NR2

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
210	QC5- Inspect part completeness to step on W/O	0.00							
210									
QC	Memo	0.00							
Quality Control	PRIOR TO PACKAGING RE-CHECK TORQUE ON CLAMPS AFTER CURED FOR 24H.								
220	Pick Kit	0.00							
220									
Packaging	Memo	0.00							
Packaging									
230	QC4- 100% Inspect kits for completeness	0.00							
230									
QC	Memo	0.00							
Quality Control									

N/A test only 6/14/7/4

N/A test only 6/14/7/4

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Item ID: D412-596-203

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Setup Start *NS1*

Revision ID:

Stop *NS2*

Item Name: 39" Aft Crosstube

Start Date: 12/09/13 Start Qty: 1.00 *1*

Cust Item ID:

Required Date: 12/10/13 Req'd Qty: 1.00 *1*

Customer:

Reference:

Run Start *NR1*

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Stop *NR2*

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
240	Packaging	0.00							
240									
Packaging	Memo	0.00							
Packaging	Identify and pack for shipping as per PPPD412-596-203								
	Location: _____								
	PPP Rev: _____								
250	QC21- Final Inspection - Work Order Release	0.00							
250									
QC	Memo	0.00							
Quality Control									

Excess
for testing

N/A 4/14/7/4

RD 544

h 4607-04

Picklist Print

Page 1

December-09-13 2:23:38 PM

Work Order ID: 109960
Parent Item: D412-596-203
Parent Item Name: 39" Aft Crosstube

Start Date: 12/09/13
Start Qty: 1.00
Required Date: 12/10/13
Required Qty: 1.00

Comments: IPP REV:A NEW ISSUE JFS 13/03/22 VERIFY BY:DD

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Qty per Kit	Total Qty	Qty Issued	Date Issued	Status
D3595-063-530 Rubber Cushion		Manufactured	No				Each	178.0000		2		AS 14-6-5	
				<u>Location</u>		<u>Loc Qty</u>	<u>Loc Code</u>						
				FG		5							
				82656		5							
				LG050		34							
				103099		8							
				106512		26							
				LG051		139							
				101880		4							
				103949		38							
				63407		6							
				67185		6							
				70067		18							
				72745		2							
				75783		7							
				79932		13							
				82656		10							
				87833		5							
				90969		21							
				99914		9							
D412-596-203TRN Crosstube Aft Extended Turning Detail		Manufactured	No			110	Each	0.0000		1	1		
D4909-1 Support		Manufactured	No				Each	0.0000		① 1		AS 14-6-5	
D4910-1 Chaffing Shield		Manufactured	No				Each	1.0000		2			

<u>Location</u>	<u>Loc Qty</u>	<u>Loc Code</u>
LG052	1	
106427	1	

Picklist Print

Page 2

December-09-13 2:23:38 PM

Work Order ID: 109960
Parent Item: D412-596-203
Parent Item Name: 39" Aft Crosstube

Start Date: 12/09/13

Required Date: 12/10/13

Start Qty: 1.00

Required Qty: 1.00

MS21920-26

Purchased

No

Each 124.0000

4

Clamp

Location

Loc Qty

Loc Code

LG050

124

102290

1

106119

16

107545

38

107974

21

109206

48

MS21920-28

Purchased

No

Each 120.0000

2

Clamp

128771

Location

Loc Qty

Loc Code

FG

5

105884

5

LG050

104

123674

10

124505

4

125351

8

M125728

1

M126085

2

M127061

34

M127544

45

LG051

11

121440

8

123243

2

124260

1

②

As 14-6-5

December-09-13 2:23:38 PM

Shop Packet Print

Page 2

Item	Qty -203	Part Number	Description
1	X	D412-596-203	CROSSTUBE ASSEMBLY (412 HI HI AFT)
2	1	D6020-170	CROSSTUBE MATERIAL
3	2	D3595-063-530	RUBBER CUSHION
4	1	D4909-1	SUPPORT
5	2	D4910-1	CHAFING SHIELD
7	4	MS21920-26	CLAMP
8	2	MS21920-28	CLAMP
9	A/R	SCOTCH-WELD DP460	EPOXY ADHESIVE, 3M SCOTCH-WELD
10	A/R	PROSEAL 890	SEALANT

GENERAL NOTES:

- 1) MATERIAL: MANUFACTURED FROM D6020-170
FINISHED LENGTH = 161.38±0.060 (BEFORE BENDING/TRIMMING)
- 2) FINISH: PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
MASK UNDERSIDE OF CROSSTUBE AS SHOWN (ZN B6-2, HATCHED AREA)
PAINT OUTSIDE PER DART QSI 005 4.2
AFTER PAINTING, REMOVE MASKING AND APPLY MATTE CLEAR COAT PER DART QSI 005 4.2
- 3) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED.
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED.
- 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX.
- 6) IDENTIFICATION: SCRIBE DART P/N "D412-596-203" AND B/N ON INSIDE OF CUFF PER DART QSI 044 6.4 (VIBRATING STYLUS)
- 7) WEIGHT: 181.1 lb RAW MATERIAL, 118.3 lb AFTER MACHINING
118.0 lb FINISHED WEIGHT
- 8) PART IS SYMMETRIC ABOUT CENTERLINE.
- 9) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE.

BENDING

- 10) BEND PROGRESSIVELY WITH A MINIMUM OF 8 PASSES. MAXIMUM TUBE FLATTENING DUE TO BENDING IS 7% (BASED ON O.D.) IN LOWER HALF OF R35 BEND AND 6% (BASED ON O.D.) ON REMAINING TUBE.
- 11) LIQUID PENETRANT INSPECT OUTSIDE SURFACE OF CROSSTUBE PER QSI 038. TO BE PERFORMED AFTER FINAL POST-BEND GRINDING. ANY ADDITIONAL GRINDING REQUIRES ANOTHER LPI INSPECTION.

ASSEMBLY

- 12) INSTALL D4909-1 CENTER SUPPORT USING A 0.04" TO 0.07" THICK LAYER OF SCOTCH-WELD DP460 PER QSI 015.
- 13) INSTALL MS21920-28 CLAMPS WITH D3595-063-530 RUBBER CUSHIONS TO SECURE THE D4909-1 SUPPORT ON TOP SIDE OF THE CROSSTUBE. ENSURE CLAMPS ARE OPPOSITE OF CROSSTUBE SUPPORT.
- 14) IF NOT ALREADY PRESENT ON CHAFING SHIELD, APPLY A THIN COAT OF PROSEAL 890 ON INSIDE CONCAVE SURFACE OF D4910-1 CHAFING SHIELD AND LET CURE PER MANUFACTURER'S INSTRUCTIONS. INSTALL PROSEALED D4910-1 CHAFING SHIELD ONTO CROSSTUBE BY APPLYING A THIN COAT OF PROSEAL 890 ONTO CROSSTUBE. BE SURE TO ELIMINATE ANY AIR GAPS.
- 15) TORQUE CLAMPS ON D4909-1 SUPPORT 80 TO 100 IN-LB. TORQUE CLAMPS ON D4910-1 CHAFING SHIELD 40 TO 50 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING. PRIOR TO PACKAGING, RE-CHECK TORQUE ON CLAMPS AFTER ADHESIVES HAVE CURED FOR 24 HOURS.

B	ADD INSPECTION WINDOW (ZN C8-1, B6-2)	CP	13.06.16
A	NEW ISSUE	CP	13.03.13
REV.	DESCRIPTION	BY	DATE
DESIGN			
DRAWN			
CHECKED			
MFG. APPR.			
APPROVED			
DE APPR.			
DATE	13.06.16		

DART AEROSPACE LTD
HAWKESBURY, ONTARIO, CANADA

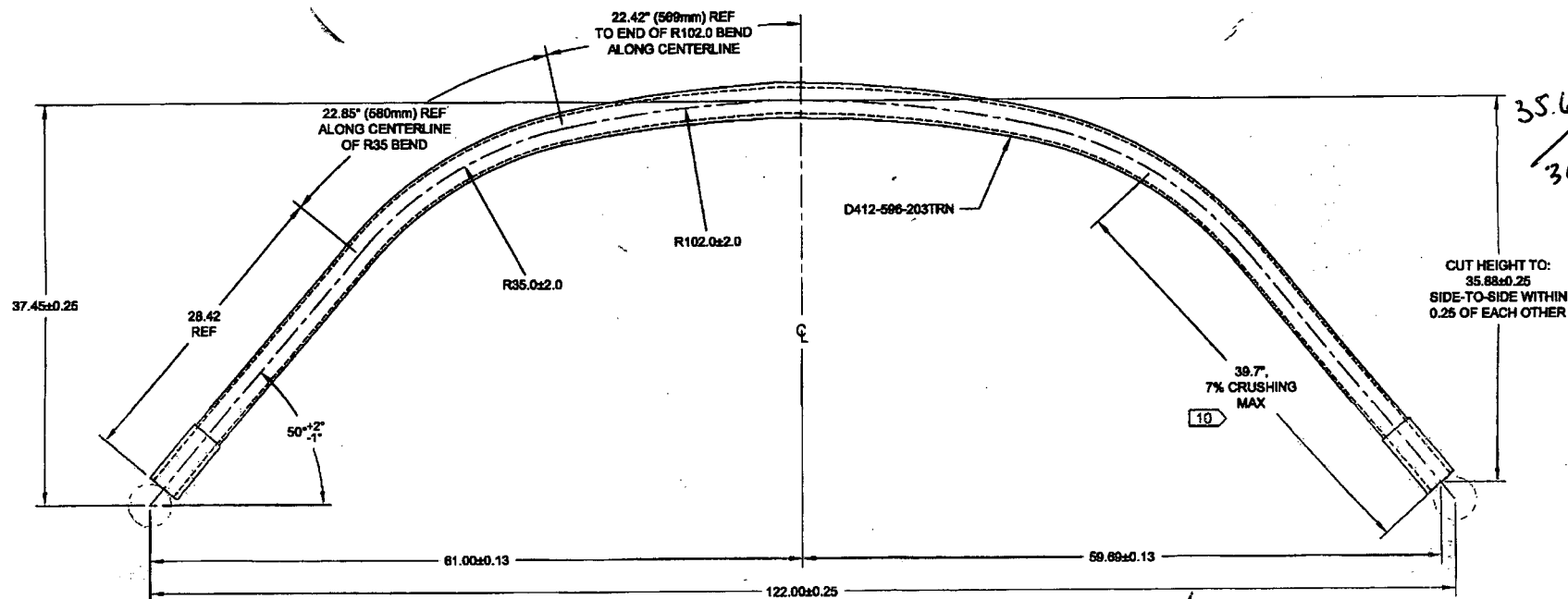
DRAWING NO. D412-596-203
TITLE CROSSTUBE ASSY (412 HI HI AFT)
SCALE NTS

REV. B
SHEET 1 OF 4

DATE 13.06.16

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RELEASED
2013-08-06



D412-596-203BND 10
BENDING DETAIL

RELEASED
2013-08-06
M

DESIGN	QP	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
DRAWN	QP		
CHECKED	A.P.	DRAWING NO.	REV. B
MFG. APPR.		D412-596-203	SHEET 3 OF 4
APPROVED		TITLE	SCALE
DE APPR.		CROSSTUBE ASSY (412 HI HI AFT)	NTS
DATE	13.06.16	<small>COPYRIGHT © 2013 BY DART AEROSPACE LTD THIS DOCUMENT IS PROPRIETARY AND CONFIDENTIAL. AND IS SUPPLIED ON THE EXPRESS UNDERSTANDING THAT IT IS NOT TO BE USED FOR ANY PURPOSES OR COPIED OR REPRODUCED IN ANY MANNER WITHOUT THE WRITTEN PERMISSION FROM DART AEROSPACE LTD.</small>	

D412-596-203

Stainless Steel Unhardened

Setup

Rollers: 3.25x3 **Without spacers**

Tangent lines: Center line
24" from center line, black
21" from center line, red

Buggy shims: 1.85" on buggy "A" on cuff

1:1 actual size drawing will be kept aside for use on further tubes.

Middle Bend

Tube begins on large table, at 24" black line, at an approach of **2740 on both rollers**.

Run programs 1,2,3, check (due to this being a prelim. tube.) Then run 4 and 5 to finish. Middle should be finished at 5. Compare middle to reference drawing, which will be placed on drill table until drawing is included on measuring board.

Side bends

Start bending from 21" red line going down taper at an approach of **3010 on both rollers**. run 1,2,3,4,5,6 check. from there on run 7-12 as needed at an approach of **3210 on both rollers** checking between each program. Programs back out automatically after each pass. On the second side, the buggy must be placed further up the taper, as it will hit the table if it is left on the cuff.

notes

13/04/03 bent preliminary tube today, side 1 was perfect, side 2 bent in too much at prog 11 by almost .400" this caused us to write program 10b to prevent over bending in the future. side 1 had a more progressive bend due to the development, this may have caused the difference in the two widths.

13/04/26

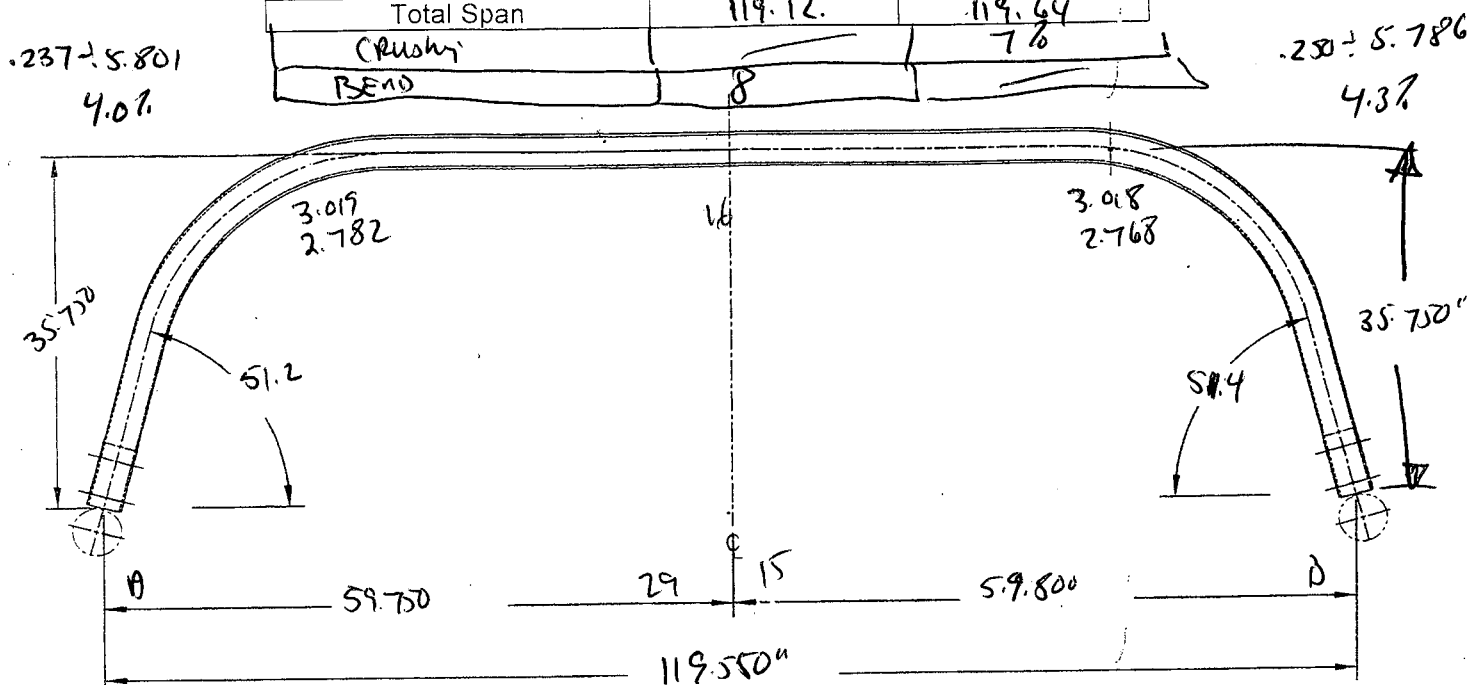
bent second prelim tube, this time hardened. the tube reacted well to the same programs, although needed additional programs in both middle and side bends to put the tube in tolerance. tube bent more quickly on the side with the heat treating holes, and finished earlier in programs.

heat treating hole side: span 59.65 finished at prog 16b
opposite side: span 59.65 finished at prog 19

1
2
3
4
5
6
7
8
9
10
11
12

DART AEROSPACE LTD	Work Order: 109960
Description: Crosstube 412 H1 H1 AFT	Part Number: D 412-S96-203
Inspection Dwg: D412-S96-203 Rev: B	Page 1 of 1

Required Dimension	Min	Max
Height	35.63	36.13
1/2 Span	59.56	59.82
Angle	49°	51° 52°
Total Span	119.12	119.64
CRUSHY		7%
BEND	8	



Accept Q Height of 35.750 " Both Sides $5/4/28$

Comments
Sine A = 4.0% crushy @ 29 Passes.
middle = 16 Passes.
Sine B = 4.3% crushy @ 15

QC15 Inspection	DAS
Date	16 9-88 14/05/28

Rev	Date	Change	Revised by	Approved
		New Issue		

Work Order ID 116639

April-22-14 1:43:23 PM

116639

PRELIMINARY ISSUE Page 1

Item ID: D412-596-203TRN

Accept

N900040100

Setup Start *NS1*

Revision ID: PRELIM

Stop *NS2*

Item Name: Crosstube Aft Extended Turning Detail

Start Date: 4/22/14 Start Qty: 1.00 *1*

Cust Item ID:

Required Date: 5/02/14 Req'd Qty: 1.00 *1*

Customer:

Reference:

Approvals: Process Plan: W Date: _____ Tooling: _____ Date: _____

Run Start *NR1*

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop *NR2*

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
Draw Nbr	Revision Nbr								
D412-596-203	PA1								

100

0.00

100

MORI SEIKI CNC LATHE LARGE

Mori Seiki

Memo

0.00

Mori Seiki CNC Lathe Large

1-Cut tube on chop saw, leave extra mat'l for facing.
2-Face tube to length.

1 / ϕ KC
14-5-1

110

QC1- Inspect dimensions to dimension sheet

0.00

110

QC

Memo

0.00

Quality Control

1 / ϕ KC
14-5-01

Work Order ID 116639

April-22-14 1:43:23 PM

116639

Page 2

Item ID: D412-596-203TRN

Accept

N19000040100

Setup Start

NS1

Revision ID: PRELIM

Item Name: Crosstube Aft Extended Turning Detail

Stop

NS2

Start Date: 4/22/14

Start Qty: 1.00

1

Cust Item ID:

Required Date: 5/02/14

Req'd Qty: 1.00

1

Customer:

Reference:

Approvals:

Process Plan:

Date:

Tooling:

Date:

Run Start

NR1

QC:

Date:

SPC (Y/N):

Date:

Stop

NR2

Sequence ID/
Work Center ID

Operation
Description

Set Up/
Run Hours

Tool ID

Tool #

Plan
Code

Accept
Qty

Reject
Qty

Reject
Number

Insp.
Stamp

120

0.00

120

MORI SEIKI CNC LATHE LARGE

Mori Seiki

Memo

0.00

Mori Seiki CNC Lathe Large

1-Fill tube with sand & install plugs on both ends

2-Turn as per Folio FB177

3- File transition lines smooth.

4-Scribe part # as per Dwg D412-596-203

FOLIO REV:

DWG REV: PA1

1 0 KC

14-05-01

130

QC1- Inspect dimensions to dimension sheet

0.00

130

QC

Memo

0.00

Quality Control

1 0 KC

14-05-02

140

QC8- Inspect parts - second check

0.00

140

QC

Memo

0.00

Quality Control

W 14-05-12

Work Order ID 116639

116639

Page 3

April-22-14 1:43:23 PM

Item ID: D412-596-203TRN Accept *N900040100* Setup Start *NS1*
 Revision ID: PRELIM Stop *NS2*
 Item Name: Crosstube Aft Extended Turning Detail
 Start Date: 4/22/14 Start Qty: 1.00 *1* Cust Item ID:
 Required Date: 5/02/14 Req'd Qty: 1.00 *1* Customer:
 Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____ Run Start *NR1*
 QC: _____ Date: _____ SPC (Y/N): _____ Date: _____ Stop *NR2*

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
150	Large Fab	0.00							
150									
Crosstubes	Memo	0.00							
Crosstubes	Grind machining marks smooth longitude way.								
180	QC15- Crosstube Dimensional Check	0.00							
180									
QC	Memo	0.00							
Quality Control									
190	Identify as per dwg & Stock Location: _____	0.00							
190	Packaging								
Packaging	Memo	0.00							
Packaging	Identify and stock in kanban rack Location: _____								

SL / 14-05-12

N/A

N/A
IW

Work Order ID 116639

April-22-14 1:43:23 PM

116639

Page 4

Item ID: D412-596-203TRN

Accept

N900040100

Setup Start

NS1

Revision ID: PRELIM

Item Name: Crosstube Aft Extended Turning Detail

Stop

NS2

Start Date: 4/22/14

Start Qty: 1.00

1

Cust Item ID:

Required Date: 5/02/14

Req'd Qty: 1.00

1

Customer:

Reference:

Approvals:

Process Plan: _____

Date: _____

Tooling: _____

Date: _____

Run Start

NR1

QC: _____

Date: _____

SPC (Y/N): _____

Date: _____

Stop

NR2Sequence ID/
Work Center IDOperation
DescriptionSet Up/
Run Hours

Tool ID

Tool #

Plan
CodeAccept
QtyReject
QtyReject
NumberInsp.
Stamp

200

QC21- Final Inspection - Work Order Release

0.00

2000

QC

Memo

0.00

Quality Control

POSITIVE RECALL
EFFECTIVE 4/22/14 AUTH 4
RELEASED _____ DATE _____

Picklist Print

Page 1

April-22-14 1:43:23 PM

Work Order ID: 116639

116639

Parent Item: D412-596-203TRN

D412-596-203TRN

Parent Item Name: Crosstube Aft Extended Turning Detail

Start Date: 4/22/14

Required Date: 5/02/14

Start Qty: 1.00

Required Qty: 1.00

Comments: IPP REV: A NEW ISSUE JFS 13/03/22 VERIFY BY: DD

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Qty per Kit	Total Qty	Qty Issued	Date Issued	Status
D6020-160		Manufactured	No			100	Each	24.0000	1	1			

D6020-160

Crosstube Material

<u>Location</u>	<u>Loc Qty</u>	<u>Loc Code</u>
BSKT	11	
98110	11	
prelim	13	
105163	13	

1

MAN. L 14/04/14

Wm. L. 10/19/19

Item	Qty -203	Part Number	Description
1	X	D412-598-203	CROSSTUBE ASSEMBLY (412 HI HI AFT)
2	1	D6020-170	CROSSTUBE MATERIAL
3	2	D3595-063-530	RUBBER CUSHION
4	1	D4909-1	SUPPORT
5	2	D4910-1	CHAFING SHIELD
7	4	MS21920-26	CLAMP
8	2	MS21920-28	CLAMP
9	A/R	SCOTCH-WELD DP460	EPOXY ADHESIVE, 3M SCOTCH-WELD
10	A/R	PROSEAL 890	SEALANT

GENERAL NOTES:

- 1) MATERIAL: MANUFACTURED FROM D6020-170
FINISHED LENGTH = 161.38±0.060 (BEFORE BENDING/TRIMMING)
- 2) FINISH: PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2.
MASK UNDERSIDE OF CROSSTUBE AS SHOWN (ZN B6-2, HATCHED AREA)
PAINT OUTSIDE PER DART QSI 005 4.2
AFTER PAINTING, REMOVE MASKING AND APPLY MATTE CLEAR COAT PER DART QSI 005 4.2
- 3) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED.
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED.
- 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX.
- 6) IDENTIFICATION: SCRIBE DART P/N "D412-598-203" AND B/N ON INSIDE OF CUFF PER DART QSI 044 6.4 (VIBRATING STYLUS)
- 7) WEIGHT: 191.1 lb RAW MATERIAL, 118.3 lb AFTER MACHINING
118.0 lb FINISHED WEIGHT
- 8) PART IS SYMMETRIC ABOUT CENTERLINE.
- 9) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE.

BENDING

- 10) BEND PROGRESSIVELY WITH A MINIMUM OF 8 PASSES. MAXIMUM TUBE FLATTENING DUE TO BENDING IS 7% (BASED ON O.D.) IN LOWER HALF OF R35 BEND AND 6% (BASED ON O.D.) ON REMAINING TUBE.
- 11) LIQUID PENETRANT INSPECT OUTSIDE SURFACE OF CROSSTUBE PER QSI 038. TO BE PERFORMED AFTER FINAL POST-BEND GRINDING. ANY ADDITIONAL GRINDING REQUIRES ANOTHER LPI INSPECTION.

ASSEMBLY

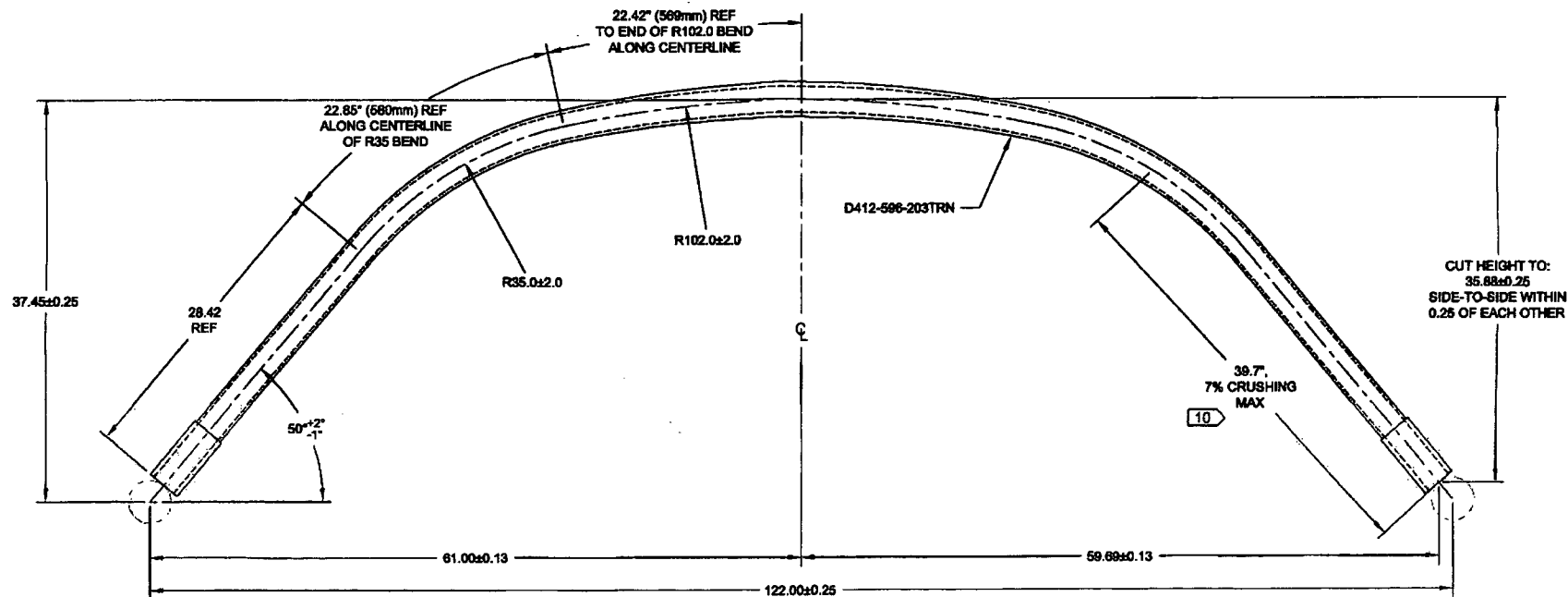
- 12) INSTALL D4909-1 CENTER SUPPORT USING A 0.04" TO 0.07" THICK LAYER OF SCOTCH-WELD DP460 PER QSI 015.
- 13) INSTALL MS21920-28 CLAMPS WITH D3595-063-530 RUBBER CUSHIONS TO SECURE THE D4909-1 SUPPORT ON TOP SIDE OF THE CROSSTUBE. ENSURE CLAMPS ARE OPPOSITE OF CROSSTUBE SUPPORT.
- 14) IF NOT ALREADY PRESENT ON CHAFING SHIELD, APPLY A THIN COAT OF PROSEAL 890 ON INSIDE CONCAVE SURFACE OF D4910-1 CHAFING SHIELD AND LET CURE PER MANUFACTURER'S INSTRUCTIONS. INSTALL PROSEALED D4910-1 CHAFING SHIELD ONTO CROSSTUBE BY APPLYING A THIN COAT OF PROSEAL 890 ONTO CROSSTUBE. BE SURE TO ELIMINATE ANY AIR GAPS.
- 15) TORQUE CLAMPS ON D4909-1 SUPPORT 80 TO 100 IN-LB. TORQUE CLAMPS ON D4910-1 CHAFING SHIELD 40 TO 50 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING. PRIOR TO PACKAGING, RE-CHECK TORQUE ON CLAMPS AFTER ADHESIVES HAVE CURED FOR 24 HOURS.

B	ADD INSPECTION WINDOW (ZN C8-1, B6-2)	CP	13.06.16
A	NEW ISSUE	CP	13.03.13
REV.	DESCRIPTION	BY	DATE
DESIGN			
DRAWN			
CHECKED			
MFG. APPR.			
APPROVED			
DE APPR.			
DATE	13.06.16		

DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
DRAWING NO. D412-598-203	REV. B SHEET 1 OF 4
TITLE CROSSTUBE ASSY (412 HI HI AFT)	SCALE NTS
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W1046639

RELEASED
2013-08-06



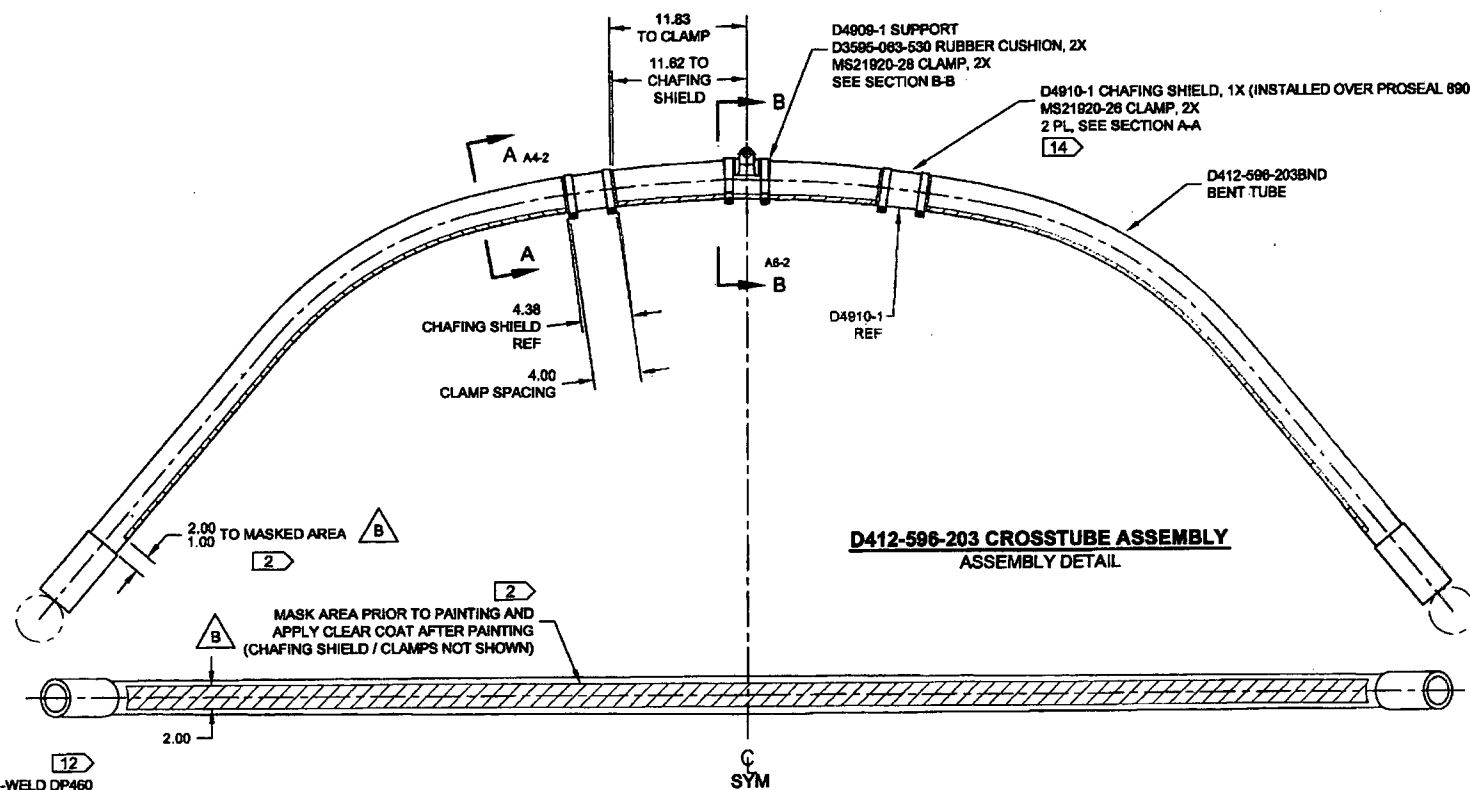
CUT HEIGHT TO:
35.88±0.25
SIDE-TO-SIDE WITHIN
0.25 OF EACH OTHER

D412-596-203BND
BENDING DETAIL

10

RELEASED
2013-08-06

DESIGN		DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
DRAWN			
CHECKED		DRAWING NO.	REV. B
MFG. APPR.		D412-596-203	SHEET 3 OF 4
APPROVED		TITLE	SCALE
DE APPR.		CROSSTUBE ASSY (412 HI HI AFT)	NTS
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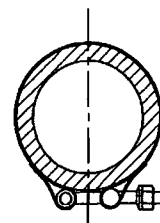
12
APPLY 3M SCOTCH-WEED DP460
BETWEEN D4808-1 SUPPORT AND
THE CROSSTUBE

D4808-1
SUPPORT
REF

D3595-063-530
RUBBER CUSHION
UNDER CLAMP, REF

13 15
MS21920-28
CLAMP, REF

SECTION B-B D4-2
SCALE 4X

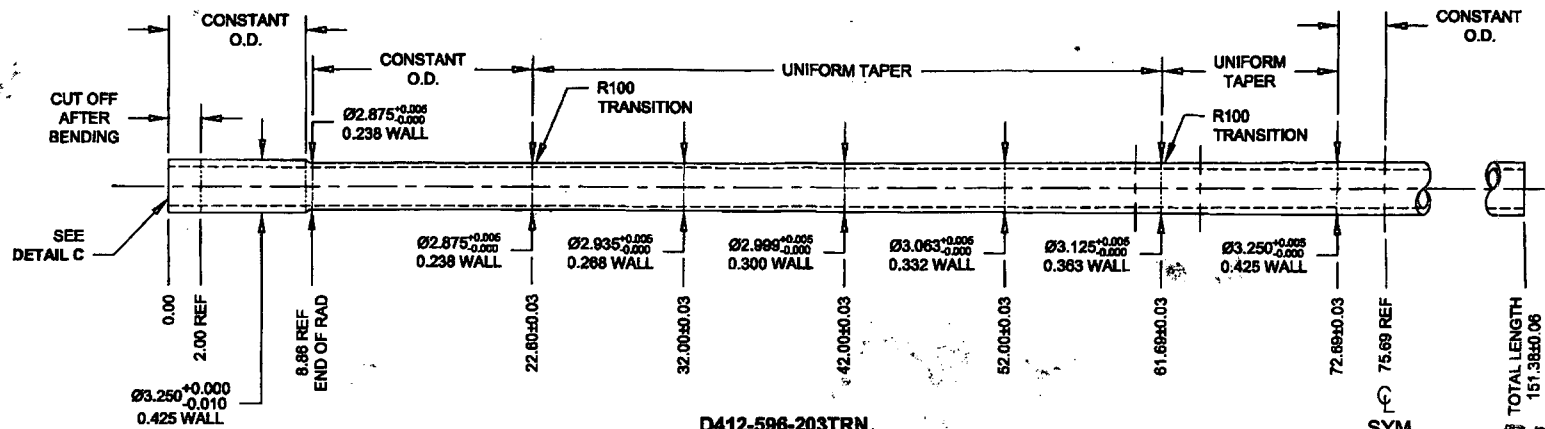


SECTION A-A C6-2
SCALE 4X

15
MS21920-28 CLAMP
REF

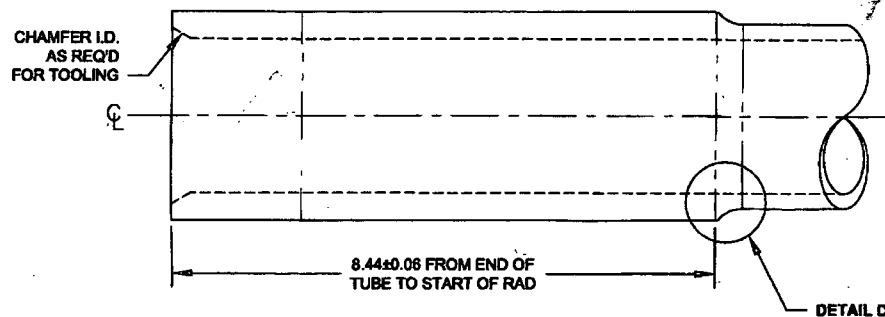
RELEASED
2013-08-06

DESIGN	<i>Q</i>	DART AEROSPACE LTD	
DRAWN	<i>Q</i>	HAWKESBURY, ONTARIO, CANADA	
CHECKED	<i>A.P.</i>	DRAWING NO.	REV. B
MFG. APPL.	<i>HA</i>	D412-596-203	SHEET 2 OF 4
APPROVED	<i>HA</i>	TITLE	SCALE
DE APPL.	<i>HA</i>	CROSSTUBE ASSY (412 HI HI AFT)	NTS
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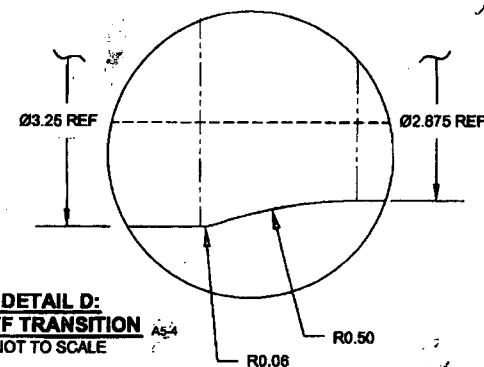


D412-596-203TRN
TURNING DETAIL

RELEASED
2013-08-06



DETAIL D:
CUFF TRANSITION
NOT TO SCALE



DESIGN	<i>[Signature]</i>	DART AEROSPACE LTD	
DRAWN	<i>[Signature]</i>	HAWKESBURY, ONTARIO, CANADA	
CHECKED	<i>[Signature]</i>	DRAWING NO.	REV. B
MFG. APPR.	<i>[Signature]</i>	D412-596-203	SHEET 4 OF 4
APPROVED	<i>[Signature]</i>	TITLE	SCALE
DE APPR.	<i>[Signature]</i>	CROSSTUBE ASSY (412 HI HI AFT)	NTS
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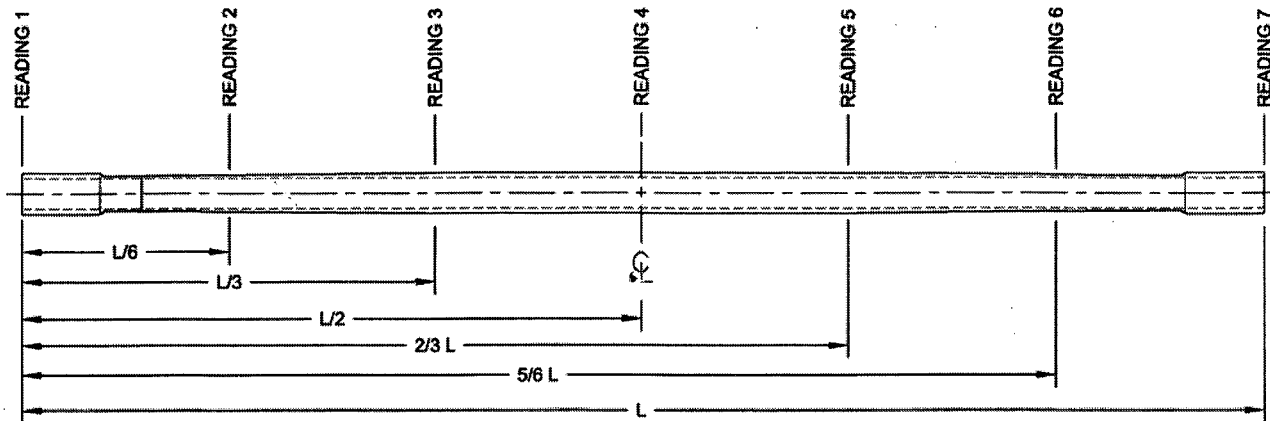
DART AEROSPACE LTD		Work Order:	116639
Description: Crosstube Assembly		Part Number:	
Inspection Dwg:	Rev:	Page 1 of 2	

FIRST ARTICLE INSPECTION CHECKLIST

Inspection Sheet Drawing Dimension		Tolerance	Actual Dimension	Accept	Reject	Method of Inspection	Comments
SIDE A							
	8.440	$\pm .060$	8.440	/		TAPE	L6C-11
	3.250	$\pm .010$	3.251	/		VERN	CNC-08
	2.875	$+.005 - .000$	2.878	/			
	2.875	$+.005 - .000$	2.878	/			
	2.935	$+.005 - .000$	2.939	/			
	2.999	$+.005 - .000$	3.003	/			
	3.063	$+.005 - .000$	3.067	/			
SIDE B	3.125	$+.005 - .000$	3.127	/			
	3.250	$+.005 - .000$	3.255	/			
	8.440	$\pm .060$	8.440	/		TAPE	L6C-11
	3.250	$\pm .010$	3.251	/		VERN	CNC-08
	2.875	$+.005 - .000$	2.877	/			
	2.875	$+.005 - .000$	2.877	/			
	2.935	$+.005 - .000$	2.939	/			
	2.999	$+.005 - .000$	3.003	/			
	3.063	$+.005 - .000$	3.067	/			
	3.125	$+.005 - .000$	3.126	/			
	3.250	$+.005 - .000$	3.255	/			
151.38		$\pm .060$	151.38	/		TAPE	L6C-11

DART AEROSPACE LTD		Work Order: 116639
Description: Crosstube Assembly		Part Number:
Inspection Dwg:	Rev:	Page 2 of 2

WALL THICKNESS MEASUREMENT



Location	WALL THICKNESS MEASUREMENT (IN)				Deviation Δw (max-min)	TOLERANCE
	w1	w2	w3	w4		
READING 1 L= 0"	438	438	434	436	.004	
READING 2 L= 25.23	.263	.269	.255	.251	.016	
READING 3 L= 50.46	.338	.348	.340	.332	.016	
READING 4 L= 75.69	.427	.444	.449	.435	.022	
READING 5 L= 100.92	.316	.351	.362	.336	.046	
READING 6 L= 126.15	.225	.272	.291	.254	.066	
READING 7 L= 151.38	.394	.453	.471	.420	.077	

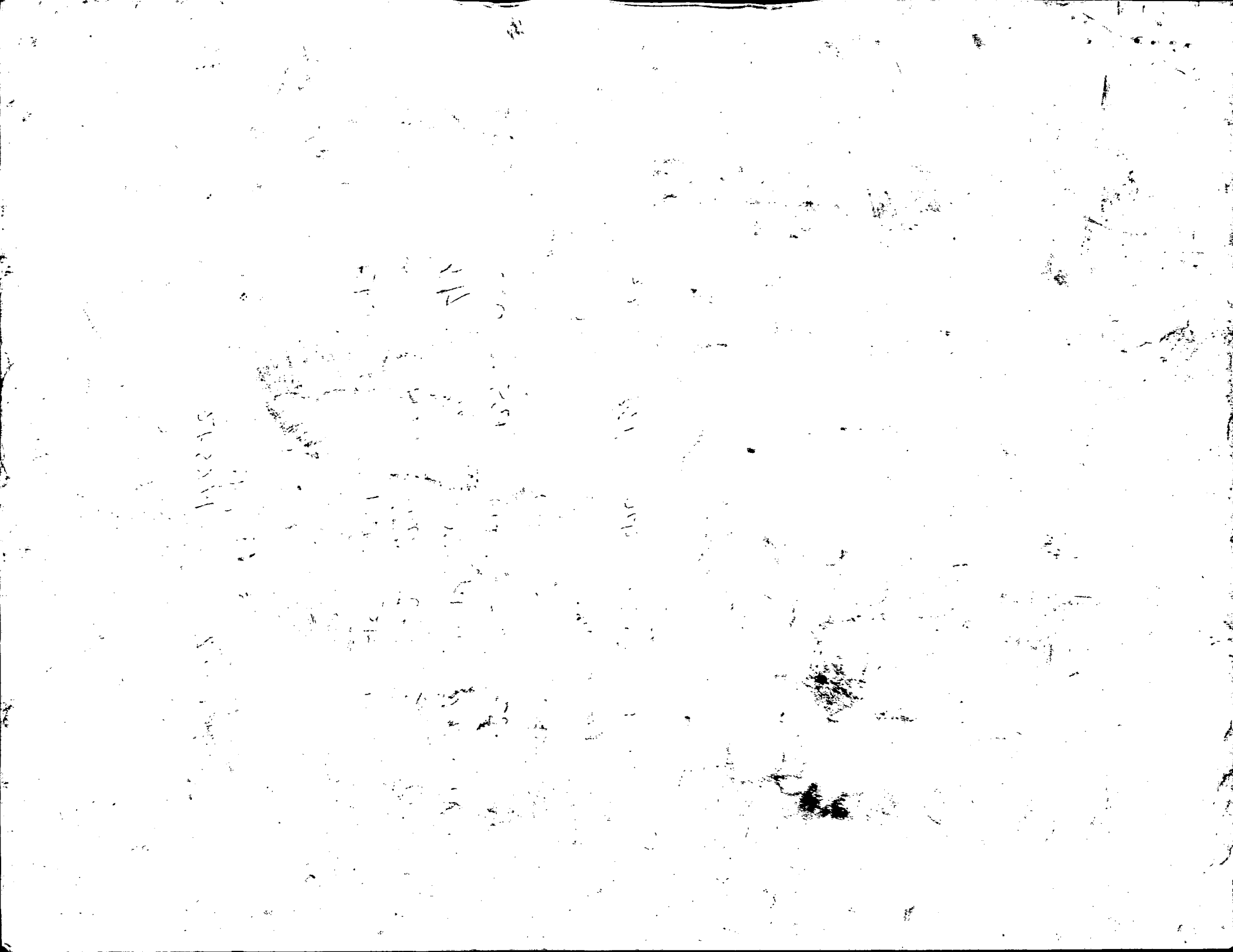
Calibration Result

Actual Block Thickness: 100.300

Sitiescan 250 Measured Thickness: 100.300

Measured by: KC	Audited by: JW	Preliminary Approval:
Date: 14-05-02	Date: 14-05-12	Date:

Rev	Date	Change	Revised by	Approved
B	10.04.14	Added preliminary approval	KJ	
C	12.06.01	Wall thickness form added	KJ	

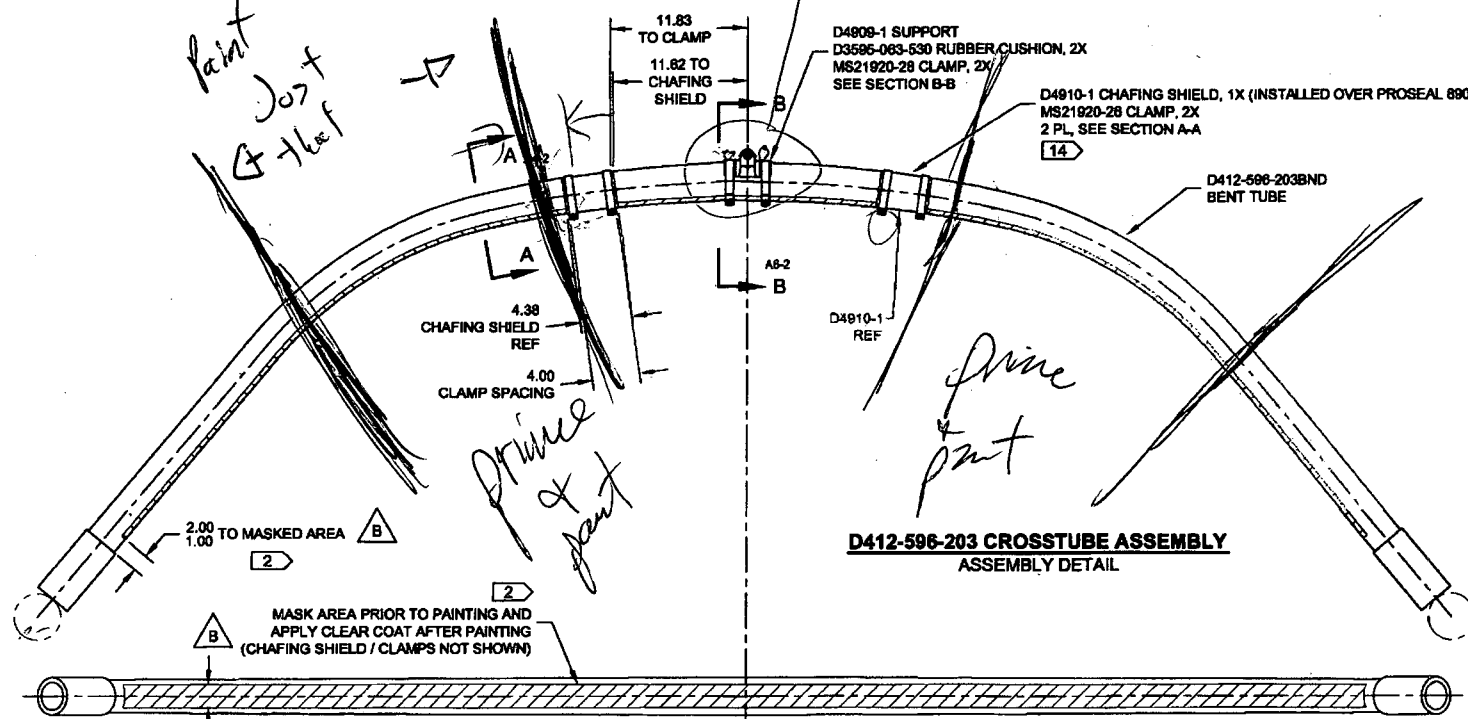


CLAMP MECHANISM ON TOP, SUPPORT ONLY

Paint Jost & thef

Prime & paint

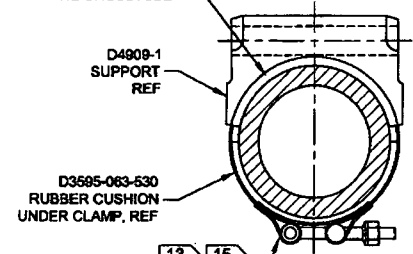
Prime & paint



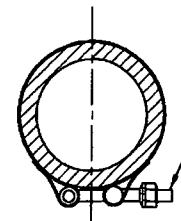
D412-596-203 CROSSTUBE ASSEMBLY
ASSEMBLY DETAIL

MASK AREA PRIOR TO PAINTING AND APPLY CLEAR COAT AFTER PAINTING (CHAFING SHIELD / CLAMPS NOT SHOWN)

APPLY 3M SCOTCH-WELD DP460 BETWEEN D4909-1 SUPPORT AND THE CROSSTUBE



SECTION B-B D4-2
SCALE 4X



SECTION A-A C6-2
SCALE 4X

RELEASED
2013-08-06

DESIGN	42	DART AEROSPACE LTD	
DRAWN	42	HAWKESBURY, ONTARIO, CANADA	
CHECKED	A.P.	DRAWING NO.	REV. B
MFG. APPR.	42	D412-596-203	SHEET 2 OF 4
APPROVED	42	TITLE	SCALE
DE APPR.	42	CROSSTUBE ASSY (412 HI HI AFT)	NTS
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skyservice Work Order Traveler

Sky Service F.B.O. Inc.

Page: 1 of 1

DOT APP 53-89 / EASA 145.7142 / BDA AMO 385

WO #: MWO21097	Customer: Dart Aerospace Ltd.	Dept: NDT YUL	Reference: 24454
Descr:	PN:	S/N:	Qty: 1
Make:	Model:	Reg:	A/C S/N:
TSN: 0	CSN: 0	TSO: 0	
Task: UNSCHEDULED			Sequence: 1



Work Required:

CARRY OUT NDT INSPECTION (LIQUID PENETRANT) ON ONE CROSSTUBES

ITEM ID: D412-596-203 39" AFT CROSSTUBE
1 - WORK ORDER ID#: 109960

DAS
27
9-89

14/6/16

Action Taken:						Date:	Initial/Stamp:
LIQUID PENETRANT INSPECTION CARRIED OUT ON ITEMS LISTED ABOVE AS PER ASTM1417M-13						JUN 04 2014	 
NO CRACK FOUND							
Pen: ZL-56 BATCH# 09H094 EXP. DATE: AUG 2014, DEV: SKD-S2 EXP. DATE: OCT2017 CLEANER: SKC-S EXP. DATE: APR 2018							
Description	Location	P/N	Qty	Batch	S/N Off	S/N On	

I certified that the maintenance described above has been performed in accordance with the applicable standard of airworthiness.

Signature:		ACA/SCA Stamp	Date:
Name:	ANTONINO MARCHETTA		JUN 04 2014